

MATH304 HW 8

due **Oct 22** before class, **answer without justification will receive 0 points**. The solution has to be typed (using \LaTeX).

1: If you pick an integer between 1 and 1000 (including 1 and 1000), what is the probability that it is either divisible by 7 or 5 or even (or two or all of these)?

2: How many multisets of 3 letters can be formed from letters M,I,S,S,I,S,S,I,P,P,I?

3: Count the number of integer solutions of

$$x_1 + x_2 + x_3 + x_4 = 28,$$

where $0 \leq x_1 \leq 6$, $0 \leq x_2 \leq 10$, $0 \leq x_3 \leq 15$, $0 \leq x_4 \leq 21$.

4: How many ways are there to distribute k distinct objects into five (distinct) boxes with at least one empty box?

5: Count the number of placements of 8 tokens on 4×4 board such that there exists a row or a column containing 4 tokens.

6: Prove that D_n is an odd number if and only if n is an even number.